(No Model.)

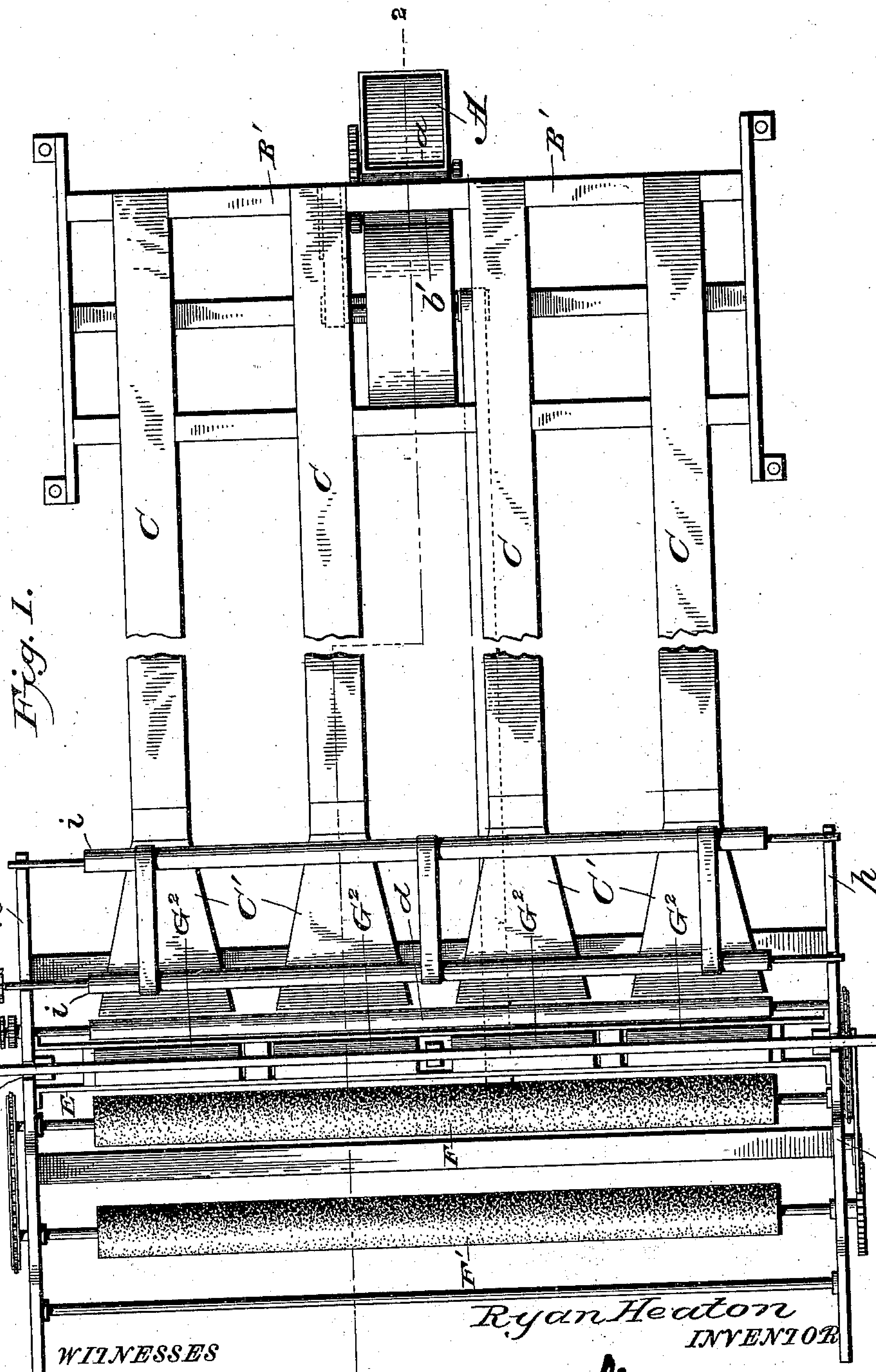
3 Sheets—Sheet 1.

R. HEATON.

APPARATUS FOR MANUFACTURING FELTED FABRICS.

No. 547,257. Patented Oct. 1, 1895.

Fig. 1.



WITNESSES

G. S. Elliott.

E. W. Johnson

Ryan Heaton

INVENTOR

by [signature]

Attorney

ANDREW B. GRAHAM PHOTO-LITHO. WASHINGTON, D.C.

(No Model.) 3 Sheets—Sheet 2.

R. HEATON.

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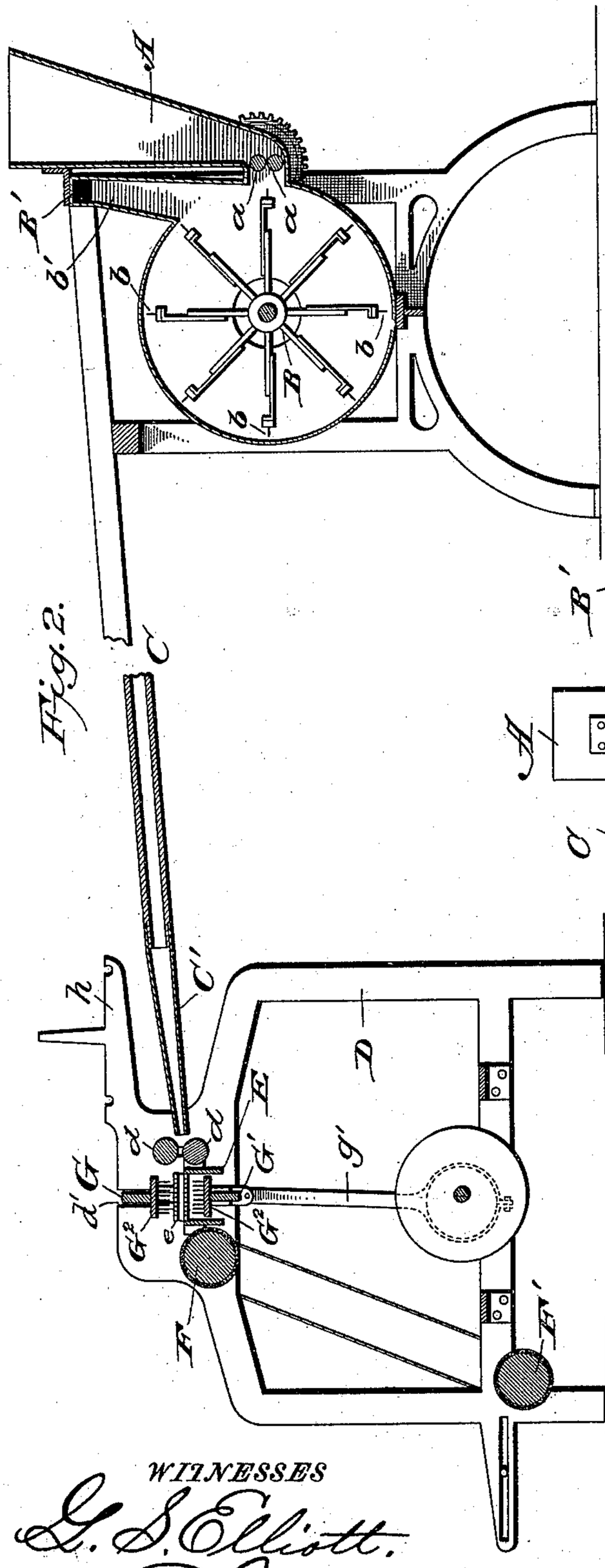

Fig. 2.

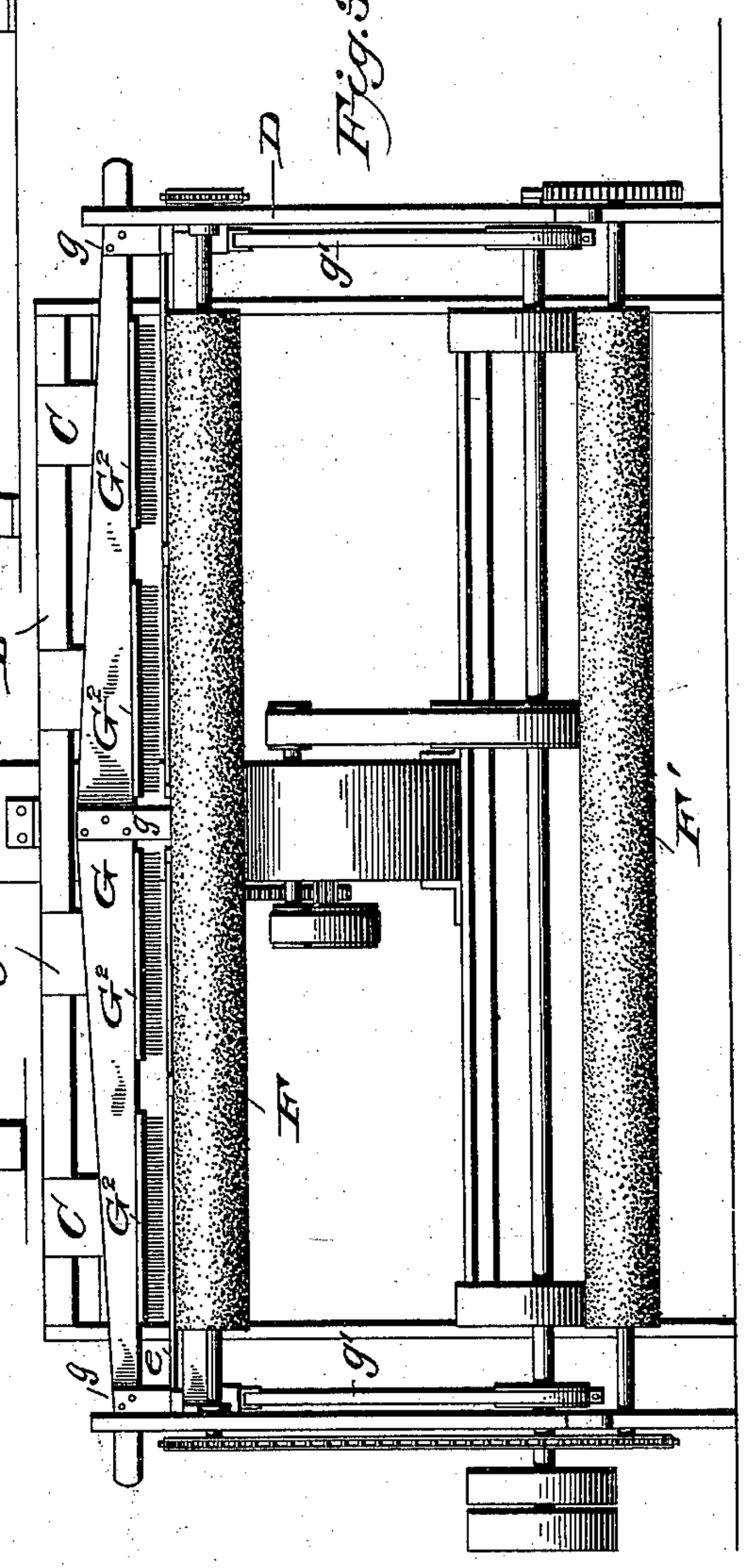

Fig. 3.

WITNESSES

L. S. Elliott.

E. M. Johnson

Ryan Heaton

INVENTOR

By E. M. Johnson Attorney

(No Model.) 3 Sheets—Sheet 3.

R. HEATON.

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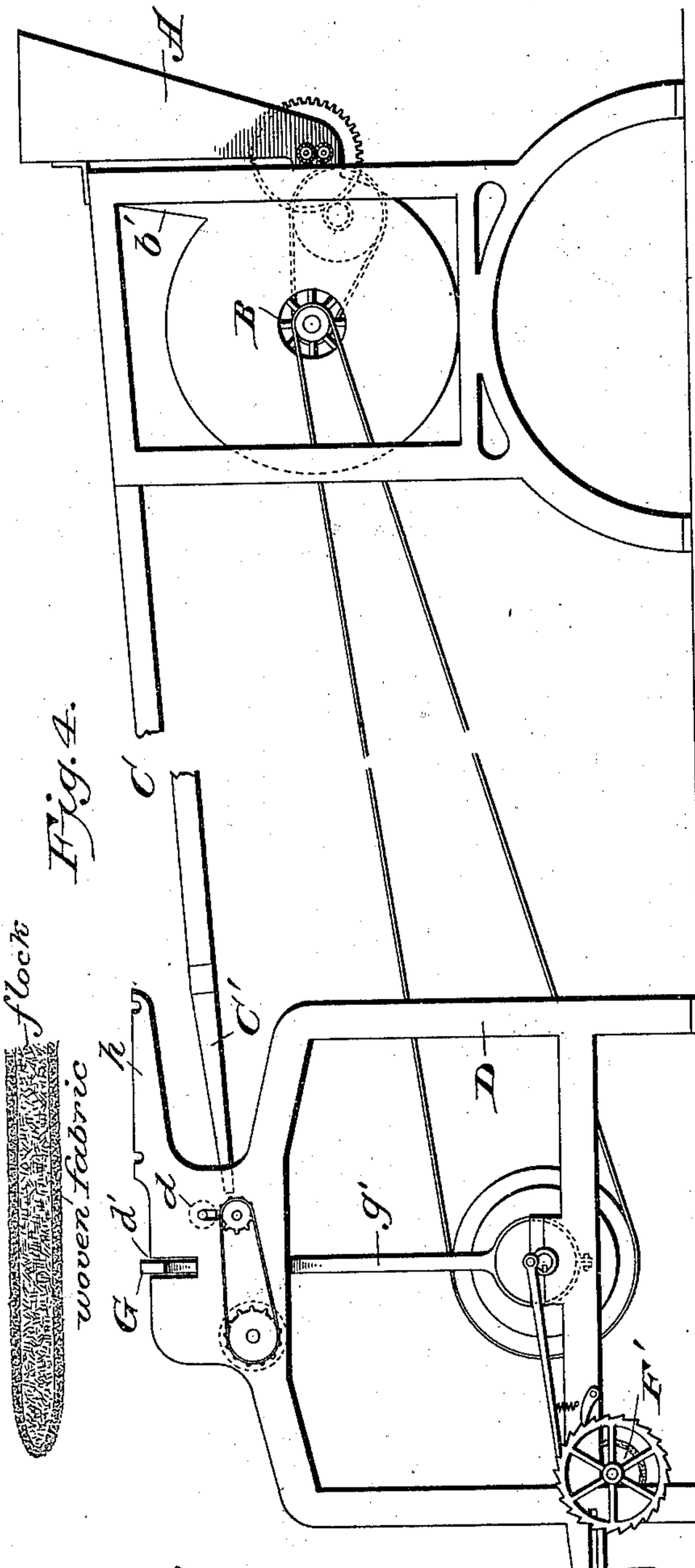

Fig. 4.

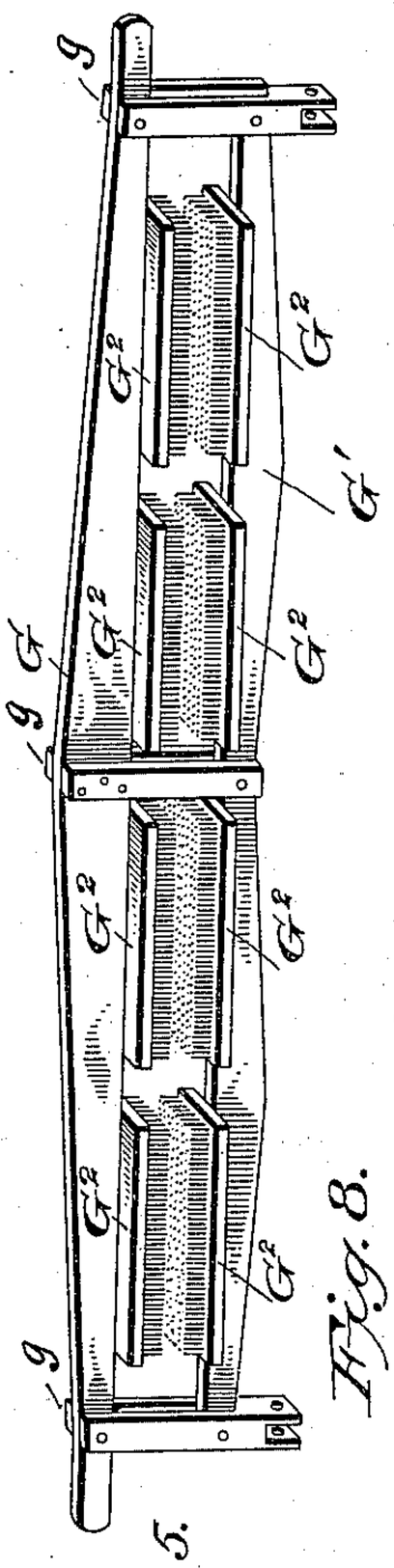

Fig. 5.

Fig. 8.

Fig. 6.

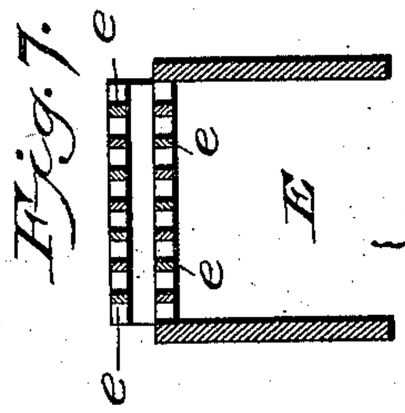

Fig. 7.

WITNESSES

G. S. Elliott.

W. Johnson

Ryan Heaton
INVENTOR

by

Attorney

UNITED STATES PATENT OFFICE.

RYAN HEATON, OF HOWELL'S DEPOT, NEW YORK.

APPARATUS FOR MANUFACTURING FELTED FABRICS.

SPECIFICATION forming part of Letters Patent No. 547,257, dated October 1, 1895.

Application filed January 24, 1895. Serial No. 536,021. (No model.)

To all whom it may concern:

Be it known that I, RYAN HEATON, a citizen of the United States of America, residing at Howell's Depot, in the county of Orange and State of New York, have invented certain new and useful Improvements in Apparatus for the Manufacture of Felted Fabrics; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

This invention relates to improvements in apparatus for the manufacture of felted fabrics, the object of the same being to provide a machine of improved construction for incorporating flock with knitted or woven fabrics, so as to produce a fabric that may afterward be used in the manufacture of felted goods.

The invention consists in the construction and combination of the parts, as will be hereinafter fully set forth, and particularly pointed out in the claims.

In the accompanying drawings, forming part of this specification, Figure 1 is a plan view of an apparatus designed to carry out my invention. Fig. 2 is a longitudinal sectional view through the line 2 2 of Fig. 1. Fig. 3 is an end view. Fig. 4 is a side view. Fig. 5 is a detail perspective view of the frame which carries the needles. Fig. 6 is a longitudinal sectional view of the frames carrying bars between which the fabric passes. Fig. 7 is a sectional view on the line 7 7 of Fig. 6, and Fig. 8 is a diagram view showing the knitted or woven fabric and flock as primarily fed between the woven or knitted fabric.

A designates a hopper, which is provided at its discharge-opening with feed-rollers *a a*, the discharge-opening entering a fan-casing, in which is mounted a fan B. The outer ends of the blades of the fan carry bars with outwardly-projecting teeth *b*. The fan-casing is connected by a suitable discharge-spout *b'* with a transverse pipe B', from which extend tubes C C, these tubes being of considerable length and provided at their ends with discharge-spouts C', which are flattened to provide openings of considerable width. The fan and feed-rollers are driven by suitable mechanism, and the teeth on the ends of the blades of the fan serve to thoroughly separate the flock as it is fed from the hopper, so that it will be effectually carried by the blast created by the fan into the pipe B' and from there into the conveying-tubes C, from which it is blown between the woven fabrics, as hereinafter more fully described. The tubes C are of considerable length, as they are adapted to have placed thereon the tubular knitted or woven fabric, the fabric being fed from the tubes to the other part of the apparatus.

D designates a suitable frame, having rollers *d d*, which are positioned adjacent to the discharge ends C' of the tubes C', and beyond said rollers are fixed frames E, consisting of upper and lower bars *e e*, which are attached to suitable supports, the bars being practically on a line with the discharge-spouts. It will be noted that the frames E are divided into sections, according to the number of discharge-spouts. At a suitable distance beyond the frames E is a roller F, which is preferably covered with card-cloth, having small projecting teeth, and this roller is suitably driven to draw the fabric through the bars of the frames E. The fabric, after passing over the roller F, is passed around a roll F', also having card-teeth, from which it passes to and is rolled upon a rod or bar.

The side pieces of the frame D are provided at their upper end with a slot *d'*, in which is guided the needle-carrying frame consisting of two bars G and G', which extend transversely across the frame D and are rigidly connected to each other by strips *g g*, as shown in Fig. 5. To the adjoining edges of the bars G and G' are attached plates G^2, which carry the needles, said needles passing between the bars *e e*, so as to operate upon the fabric and flock which is fed between the same. The needle-carrying frame is reciprocated by means of rods *g'*, which are connected at their upper ends to the depending end pieces of the frame and at their lower ends engage eccentrics on a driven shaft.

The rollers, fan, and bars carrying the needle-plates are operated in the manner illustrated in the accompanying drawings or by equivalent means. The driving and operating mechanism may be varied without departing from the spirit of my invention.

In operation the woven or knitted fabric, which is preferably in circular or tubular form, is placed upon the tubes C by removing the discharge ends C′ thereof, and the flock being placed in the hopper and the fan started is carried by the current of air through the tubes C C′ to the fabric which is guided between the rollers *d d* and bars *e e*, where it is operated upon by the barbed needles, after which it passes to the roller F, having the card-face. The upper and lower parts of the tubular fabric with the flock between are partly compressed by the rollers *d d* and the reciprocating needles thoroughly incorporate the flock with the woven fabric, the fibers intermingling. By means of this apparatus the flock is not only interwoven or incorporated with the woven fabric, but the fibers of the two parts of the fabric are also thoroughly interlocked. The fabric thus produced loses to a great extent the characteristics of a woven fabric, and makes felted goods which are much stronger than where the fabrics are merely felted together. After the fabric is made it is ready to be made up into articles by the usual methods, the fulling-machine being employed. If in practice it is desired to add additional flock, it can be fed to the outer face of the tubular fabric from an endless carrier of the ordinary belt-type carried by the rollers *i i*, supported upon the arms *h* of the frame D, the flock being fed by hand upon the carrier-belt, so that it will be deposited upon the fabric as it is drawn through the rollers *d d*.

I do not wish to limit myself to the use of tubular fabric, as strips of knitted or woven fabric can be used and fed between the rollers *d d;* but I prefer to use a tubular fabric, as it prevents the flock being blown out between the edges of the upper and lower fabrics.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a machine for uniting flock with a knit or woven fabric, the combination, of a hopper with a fan having teeth on the ends of the blades, a conduit communicating with the fan casing, and a series of distributing tubes connected to the conduit and provided with laterally expanded and vertically contracted ends, substantially as shown and for the purpose set forth.

2. In an apparatus for uniting flock with a knit or woven fabric, the combination, of a hopper having discharge rollers *a a*, a fan-casing connected with said hopper, a plurality of flock distributing tubes communicating with the fan-casing by means of a conduit, and a fan the blades of which move adjacent to the discharge opening in the hopper; together with reciprocating needle-bars and rollers for feeding the fabric and flock between the reciprocating needle-bars, substantially as shown and described.

3. In an apparatus for uniting flock with a knitted or woven fabric, the combination, of the flock distributing tubes, fixed bars between which the fabrics and flock pass, and reciprocating needle-carrying frame the needles of which pass between the bars and through the fabrics and flock, substantially as shown and for the purpose set forth.

4. In an apparatus for uniting flock with woven or knitted fabrics and said fabrics to each other, of tubes upon which the woven or knitted fabrics are placed so that the flock will be discharged between them, rollers adjacent to the discharge openings of the tubes, apertured holding plates or bars beyond the rollers, a needle-carrying frame, the needles operating through the apertured holding plates or bars, mechanism for reciprocating the needle-carrying frame and a roller F, the parts being organized substantially as shown and for the purpose set forth.

In testimony whereof I affix my signature in presence of two witnesses.

RYAN HEATON.

Witnesses:
G. R. BREEN,
J. W. HEATON.